REVIEW ARTICLE

Research Impact & Metrics

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INTRODUCTION

Medical research can offer both solutions for existing problems and modification in the current treatment guidelines. It can impact either a limited group of patients or the whole population. In other words, research impact is the link between research outputs and public health[1].

Research should not just sit on a shelf doing nothing but collecting dust, instead it should be thoughtfully published[2]. The research should get disseminated to a wide range of health care stakeholders who have influence in areas where it can actually enact change. The patient subset must be considered when designing research outputs so as to ensure that the findings are accessible and that they can be widely used as a tool for change.

Being an Academician and a Researcher

From a practical point of view, medical scientists while working on any study are always under great pressure for time and resources. Designing a protocol where they will be able to participate and learn is, therefore, of the utmost importance[3].

Lessons learned are a key part of any research work. One should use lessons of the past to inform the future wherever possible as it can act as a catalyst for a research study set up, while also offering information on what hasn't worked previously. That doesn't mean a research team has to follow lessons learned, but it's sensible to consider them.

In the present context, there should be a coexistence of traditional academic activities with research. It's about adding to what already exists, and not substitution.

There is a need to encourage academics and researchers to think in more detail about impact from the inception of a study, and who will be affected by the findings, the research has far more of a coherent arc throughout the study and the consideration of impact has a tangible effect on the researchers' focus throughout.

Disseminating Your Research Work

Dissemination involves the publication and discovery of academic research. It can be thought of as a niche group interested in academics talking about a common topic and sharing knowledge.

However, we are living in a digital era with online open access[4]. A digital identity is a set of validated digital attributes and credentials for the digital world, similar to a person's identity for the real world. Additionally, there are various online open access repositories (**Figshare**, being the most prominent one) where researchers can preserve and share their research outputs in a citable, shareable and discoverable manner[5].

More exposure for your work
Researchers in developing countries can see your work
Practitioners can apply your findings
Taxpayers get value for money
Higher citation rates
Compliant with grant rules
Your research can influence policy
The public can access your findings

Figure 1:- Adapted from Benefits of Open Access by Danny Kingsley and Sarah Brown, http://aoasg.org.au/. CC-BY

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The adjoining figure demonstrates benefits of an online open access system and how it works. It basically involves a dissemination between or within the academic and or research field of specific industries or topics for the purpose of collecting, verifying, understanding, and or sharing information that can be used to broaden knowledge and understanding of a topic or principle or other aspect of interest[6].

Research Publication Metrics

The capacity to assess the impact of research publications is a growing area of significance, particularly for the purposes of applying to secure financing and partaking in career progression. Understanding how research is assessed can also assist one to identify impactful journals to publish with. It is essential to take note that research publication metrics do not supplant other measures of excellence such as peer review - however stand close by as a more extensive measure of impact[7].

Metrics can be of either **Bibliometrics or Altmetrics**. Bibliometrics provides a quantitative analysis of the impact of research. It takes into account the number of citations for individual articles to look for how they would have impacted on the research arena. It stands side by side with the other qualitative measures of excellence such as peer review[8].

Bibliometrics

- **Authors and Institutions:** This includes publication and citation counts, also known as the *h-index*. It was originally proposed by Mr. J. E. Hirsch in the year 2005, and since then it has gained a great popularity among researchers however bibliometics scholars have also proposed a few variants (i.e., *g-index* and *m-index*).
- **Journals:** Many of the journal level metrics are based on ranking journals. This is in turn based on the number of citations. Examples include the Journal Impact Factor (i.e., citations over a period of preceding two years) and CiteScore (i.e., citations that are divided by publications over a period of preceding four years).

Finding Out Your *h-index*

Here, we would like to elaborate on *h-index* since it is the best author level metric in scientific research. The *h-index* attempts to measure the impact of the published work of a researcher. Itis the maximum value *h* such that *h* articles have minimum *h* citations each. For example, if an author has six publications, with 10, 9, 6, 4, 3 and 2 citations (in descending order of citations), then the author's *h-index* is 4, because the author has four publications with 4 or more citations.

There are a number of resources where an author's *h-index* can be found out, however the value of the *h-index* can differ depending upon the resource. For example, the *h-index* calculated from Google Scholar tends to be more than that from Web of Science and or SCOPUS. From the Web of Science, an author can find out *h-index* for all his/her publications. Search is done by entering either the author's name or his/her ORCID or ResearcherID. Whereas, SCOPUS has an author summary page containing *h-index* along with all other author information. Google Scholar is another great resource for finding out the *h-index,* however it requires you to create a Google Scholar profile before providing the *h-index* and other metrics[9].

Altmetrics

Altmetrics is a type of non-conventional bibliometrics which is designed to complement other measures such as citation counts, impact factors etc[10]. Measures in altmetrics include:

- **View Counts:** includes page hits and PDF downloads.
- **Discussions:** includes blogs, comments and wikipedia citations. This also includes social media activities especially on Twitter, YouTube and Facebook.
- **Saves:** includes tools like CiteULike, Mendeley etc.

As is the case with the conventional bibliometrics, there is no common approach to what measures are the best for calculating altmetrics. Although, these measures are highly controversial and debated- with some arguing for their use while others arguing against them. It is necessary to note here that the bibliometric or altmetric scores alone cannot effectively evaluate scholarly works[11].

CONCLUSION

Research impact is to improve and or change the current practices. Moreover, it allows us to identify strategic and key factors that help us to manage the health care challenges effectively.

Research outputs should be widely distributed. Using a consistent form of name and author IDs (ORCID and or ResearcherID), mentioning institutional affiliations, promoting one's research in social media (Twitter, Facebook, YouTube), self-citations as well and platforms (Figshare) for sharing research outputs are certain suggestions for a better research impact and in return, the individual author's profile including the *h-index* would be raised.

REFERENCES

1. Mitchell VW, Harvey WS, Wood G. Where does all the 'know how'go? The role of tacit knowledge in research impact. Higher Education Research & Development. 2022 Jul 29;41(5):1664-78.
2. Knight E, Mitchell V. The 'how'rather than the 'what'of research impact. Higher Education Research & Development. 2022 Apr 7:1-4.
3. Greenhalgh T, Jackson C, Shaw S, Janamian T. Achieving research impact through co-creation in community-based health services: literature review and case study. The Milbank Quarterly. 2016 Jun;94(2):392-429.
4. Antelman K. Do open-access articles have a greater research impact?. College & research libraries. 2004 Sep 1;65(5):372-82.
5. Singh J. FigShare. Journal of Pharmacology and Pharmacotherapeutics. 2011 Apr 1;2(2):138-.
6. Quarati A, Raffaghelli JE. Do researchers use open research data? Exploring the relationships between usage trends and metadata quality across scientific disciplines from the Figshare case. Journal of Information Science. 2022 Aug;48(4):423-48.
7. Kulikowski K, Przytuła S, Sułkowski Ł. When publication metrics become the fetish: The research evaluation systems' relationship with academic work engagement and burnout. Research Evaluation. 2022 Oct 3.
8. Roldan-Valadez E, Salazar-Ruiz SY, Ibarra-Contreras R, Rios C. Current concepts on bibliometrics: a brief review about impact factor, Eigenfactor score, CiteScore, SCImago Journal Rank, Source-Normalised Impact per Paper, H-index, and alternative metrics. Irish Journal of Medical Science (1971-). 2019 Aug;188(3):939-51.
9. Hu G, Wang L, Ni R, Liu W. Which h-index? An exploration within the Web of Science. Scientometrics. 2020 Jun;123(3):1225-33.
10. Myers BA, Kahn KL. Practical publication metrics for academics. Clinical and Translational Science. 2021 Sep;14(5):1705-12.
11. Peterson CJ, Anderson C, Nugent K. Alternative publication metrics in the time of COVID-19. InBaylor University Medical Center Proceedings 2022 Jan 2 (Vol. 35, No. 1, pp. 43-45). Taylor & Francis.